

WHAT IS CLAIMED IS:

1. A bi-directional printing method using a printing apparatus, the printing apparatus being capable of mounting thereon a first ink set and a second ink set that have mutually different combinations of inks and being  
5 capable of using a first bi-directional print mode that selectively uses inks included in the first ink set and a second bi-directional print mode that selectively used inks included in the second ink set so that a combination of inks used in the first bi-directional print mode is different from a  
10 combination of inks used in the second bi-directional print mode, the printing method comprising the steps of:

(a) providing a plurality of position adjustment values including a first position adjustment value for the first bi-directional print mode and a second position adjustment value for the second bi-directional print mode as  
15 position adjustment values for reducing misalignments of dot forming positions on forward passes and backward passes of main scanning;

(b) selecting a position adjustment value for a bi-directional print mode used by the printing apparatus out of the plurality of position adjustment values; and

20 (c) adjusting dot forming positions along the main scanning direction during the bi-directional printing based on the selected position adjustment value.

2. A method according to claim 1, wherein  
25 the first bi-directional print mode and the second bi-directional print mode are bi-directional color printing modes.

3. A method according to claim 1, further comprising the steps of:

(d) generating a test pattern to be printed, wherein the test pattern

can be used to test misalignments of the dot forming positions; and

(e) allowing a user to set a position adjustment value that is to be stored in the position adjustment value storage according to a printed result of the test pattern,

5            wherein the step (d) includes generating a test pattern suitable for the first bi-directional print mode and a test pattern suitable for the second bi-directional print mode.

4. A method according to claim 3, wherein  
10            an ink cartridge containing the ink set comprises a memory that stores information including types of contained inks, and  
the step (d) includes:

displaying a plurality of bi-directional print modes available to the printing apparatus based on the information read out from the memory  
15            and allowing a user to select a bi-directional print mode that is to be subject to setting of the position adjustment value out of the plurality of available bi-directional print modes; and

generating the test pattern suitable for the selected bi-directional print mode.

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5. A method according to claim 1, wherein  
an ink cartridge containing the ink set comprises a memory that stores information used to set the position adjustment value, and  
the step (a) includes:

25            setting the position adjustment value based on the information read out from the memory.

6. A method according to claim 1, wherein  
the step (b) includes:

using a preset standard value when the position adjustment value for a bi-directional print mode used by the printing apparatus is not prepared in advance.

- 5           7. A method according to claim 1, wherein  
the step (b) includes:

using the position adjustment value for another bi-directional print mode when the position adjustment value for a bi-directional print mode used by the printing apparatus is not prepared in advance.

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8. A method according to claim 1, wherein  
the step (b) includes:

outputting a warning when the position adjustment value for a bi-directional print mode used by the printing apparatus is not prepared in  
15 advance.

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9. A printing apparatus comprising a print head that has a plurality of nozzle groups each including a plurality of nozzles for ejecting an identical color, the printing apparatus having a bi-directional printing  
20 function of performing main scanning for moving the print head relative to a printing medium and sub scanning for moving the print head relative to the printing medium in a direction that transverses a direction of the main scanning, and ejecting ink from nozzles onto the printing medium on each of forward passes and backward passes of the main scanning of bi-directional  
25 movement to form dots on the printing medium, the printing apparatus comprising:

a position adjustment value storage that stores a position adjustment value for reducing misalignments of dot forming positions between forward passes and backward passes of the main scanning;

a position adjuster that adjusts dot forming positions along the main scanning direction during the bi-directional printing based on the position adjustment value stored in the position adjustment storage; and

an ink cartridge mount that can mount one or more ink cartridges  
5 thereon, the one or more ink cartridges having ink tanks each containing ink to be supplied to each of the nozzle groups,

wherein the printing apparatus can use a first ink set and a second ink set that have mutually different combinations of available inks through replacement of at least one of the ink tanks with another ink tank  
10 containing different type of ink,

the printing apparatus can use a first bi-directional print mode that selectively uses inks included in the first ink set and a second bi-directional print mode that selectively used inks included in the second ink set so that a combination of inks used in the first bi-directional print mode is different  
15 from a combination of inks used in the second bi-directional print mode,

the position adjustment value storage can store a plurality of position adjustment values including a first position adjustment value for the first bi-directional print mode and a second position adjustment value for the second bi-directional print mode, and

20 the position adjustment unit selects a position adjustment value for a bi-directional print mode used by the printing apparatus out of the plurality of position adjustment values to adjust dot forming positions.

10. A printing apparatus according to claim 9, wherein  
25 the first bi-directional print mode and the second bi-directional print mode are bi-directional color printing modes.

11. A printing apparatus according to claim 9, further comprising:  
a test pattern generator that generates a test pattern to be printed,

wherein the test pattern can be used to test misalignments of the dot forming positions; and

a position adjustment value setter that allows a user to set the position adjustment value to be stored in the position adjustment value storage,

wherein the test pattern generation unit can generate a test pattern suitable for the first bi-directional print mode and a test pattern suitable for the second bi-directional print mode.

12. A printing apparatus according to claim 11, wherein the ink cartridge comprises a memory that stores information including types of contained inks,

the printing apparatus comprises a reader for reading out information stored in the memory,

the position adjustment setter displays a plurality of bi-directional print modes available to the printing apparatus based on information read out by the reader and allows a user to select a bi-directional print mode to be subject to setting of the position adjustment value out of the plurality of available bi-directional print modes; and

the test pattern generator generates the test pattern suitable for the bi-directional selected via the position adjustment value setter.

13. A printing apparatus according to claim 9, wherein the ink cartridge comprises a memory that stores information used to set the position adjustment value, and

the printing apparatus further comprising:

a reader that reads out the information from the memory; and

a position adjustment value setter that sets the position adjustment value based on the information read out from the memory.

14. A printing apparatus according to claim 9, wherein  
the position adjuster uses a preset standard value when the position  
adjustment value storage does not store the position adjustment value for  
5 the bi-directional print mode used by the printing apparatus.

15. A printing apparatus according to claim 9, wherein  
the position adjuster uses the position adjustment value for another  
bi-directional print mode when the position adjustment value storage does  
10 not store the position adjustment value for the bi-directional print mode  
used by the printing apparatus.

16. A printing apparatus according to claim 9, wherein  
the position adjuster outputs a warning when the position adjustment  
15 value storage does not store the position adjustment value for the  
bi-directional print mode used by the printing apparatus.

17. A computer program product for implementing bi-directional  
printing using a printing apparatus, the printing apparatus being capable of  
20 mounting thereon a first ink set and a second ink set that have mutually  
different combinations of inks and being capable of using a first  
bi-directional print mode that selectively uses inks included in the first ink  
set and a second bi-directional print mode that selectively used inks  
included in the second ink set so that a combination of inks used in the first  
25 bi-directional print mode is different from a combination of inks used in the  
second bi-directional print mode, the computer program product comprising:  
a computer-readable medium; and  
a computer program stored on the computer-readable medium, the  
computer program comprising:

a first program that causes a computer to select a position adjustment value for a used bi-directional print mode out of a plurality of position adjustment values including a first position adjustment value for the first bi-directional print mode and a second position adjustment value for the second bi-directional print mode as position adjustment values for reducing misalignments of dot forming positions between forward passes and backward passes of main scanning; and

a second program that causes the computer to adjust dot forming positions along the main scanning direction during the bi-directional printing based on the selected position adjustment value.